

"inwardness" of migration as was the case a century ago, and that practically all our information on this subject is connected with mass-movements, so that we are ignorant of the wanderings of individual birds. The acquisition of a knowledge of such individual movements will, it is urged, aid, not only in the study of the general migration of species, but will assist in analysing the factors connected with migration as a whole. Active measures are being taken to inaugurate a system of bird-marking in the United States.

A similar movement has been started in this country by Mr. H. F. Witherby, the editor of *British Birds*, the details of which will be found in the June issue of that serial. The rings used for marking are extremely light, and do not in any way interfere with the bird's power of flight; each is stamped "Witherby, High Holborn, London," and bears a distinctive number, which in the smaller sizes is stamped inside the ring, and it is hoped that anyone into whose hands should fall a bird so marked will send the bird and the ring, or, if this is not possible, then the particulars of the number on the ring, the species of bird, and the locality and date of capture, to the address given.

Yet another centre for bird-marking is to be established at Aberdeen, as announced in the June number of *British Birds*.

The history of the rise and progress of ornithology in South Africa is presented in concise and popular form by Mr. A. Haagner in Popular Bulletin No. 2 of the South African Ornithologists' Union, recently published at Pretoria.

To No. 1679 of the Proceedings of the U.S. National Museum Mr. E. A. Mearns contributes a paper on new and rare birds from the Philippines, while in No. 1683 of this serial the same author gives a list of birds recently collected in the Philippines, Borneo, and certain other Malay islands.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

DR. E. KNECHT has been appointed professor of technological chemistry in the University of Manchester.

FROM the *Observatory* we learn that Mr. J. Lunt, astrophysical assistant at the Cape Observatory, has been given the honorary degree of D.Sc. by the University of Manchester.

THE annual meeting of the Midland Agricultural and Dairy College will be held on Monday, July 26, when the report on the year's work will be presented. The Duke of Rutland will address the meeting, and present the diplomas and certificates gained during last session.

MERELY to mention the titles of four of the six articles contained in the February-March issue of the *Southern Educational Review* is to demonstrate the importance its editor attaches to the education of the negro. These articles are those on "Results of Attempts at the Higher Education of the Negro of the South," "The Essential Requirements of Negro Education," "Negro Rural Schools," and "Relation of the State to the Education of the Negro." The review is published at Chattanooga, Tenn., U.S.A., by the editor, Mr. H. Elmer Bierly.

It is proposed to establish in connection with the Paris University a system of exchange between French and foreign professors on similar lines to that which has for some time been in vogue between Berlin and America. M. Liard, rector of the university, has made an appeal to the friends of the university to create a fund for the purpose. M. Albert Kahn has placed at the disposal of the rector an annual grant of 30,000 francs for five years. The *Revue scientifique* states that two million francs are necessary for the success of the scheme.

It is announced by the New York correspondent of the *Times* that Mr. John D. Rockefeller has celebrated his seventieth birthday by giving 2,000,000l. to the General Education Board, which he founded in 1907 for the purpose

of endowing American colleges and universities. The Board had already received 8,600,000l. from him. Some forty institutions of higher education have benefited by this trust, including Harvard and Yale Universities. The correspondent states that the Board's policy is governed by the belief that every city of more than 100,000 inhabitants should possess a college. The annual income of the Board is said to be 200,000l.

THE accounts of the London Polytechnics for the year ended July 31, 1908, have been printed by the London County Council. The council's comptroller points out that the total ordinary receipts of these eleven institutions amounted to 212,495l., an increase of 8,543l. over the previous year. The council's grants amounted to 80,503l., or 37.88 per cent. of the total receipts. Grants from the Board of Education amounted to 38,229l., or 17.99 per cent.; the sums received from the City Parochial Foundation were 27,704l., or 13.04 per cent., and from City companies, &c., 6,929l., or 3.26 per cent. The total ordinary expenditure on revenue account of all the polytechnics amounted to 211,950l., an increase of 4,431l. over the previous year. Taking the results as a whole, so far as ordinary income and expenditure are concerned, there was a surplus of 545l. on the institutions, as compared with a deficit of 3,567l. in 1906-7. The amount expended on teachers' salaries reached 99,286l., or 47.84 of the total expenditure; other salaries accounted for 25,509l., or 12.30 per cent.; rent, rates, and taxes absorbed 11,586l., or 5.58 per cent.; and apparatus and other educational appliances and furniture cost 18,327l., or 8.83 per cent. of the total expenditure.

TEACHERS at agricultural schools and colleges in this country will be interested in the full and detailed syllabus issued by the Colorado State Agricultural College. The requirements for admission strike an English teacher as severe, and we can only congratulate the Colorado College if it is in a position to insist on the high standard they imply. The student is expected to have a certain acquaintance with English literature, gained by reading specified classics, and to be "familiar with the essential principles of rhetoric," including the following:—"choice of words, structure of sentences and paragraphs, the principles of narration, description, exposition, and argument." History is another essential subject, and the teacher who is preparing pupils for the college is informed that "the mere learning of a text will not give the preparation that the colleges desire. Effort should be made to cultivate the power of handling facts and of drawing proper deductions from data, to develop the faculty of discrimination, to teach the pupils the use of books, and how to extract substance from the printed page." The other subjects—mathematics, chemistry, physics, "other languages"—are to be taught in a similar spirit. Students so trained would form admirable raw material, and could have no great difficulty in taking the fullest advantage of the college course.

THE Board of Education has issued [Cd. 4736] its regulations for technical schools, schools of art, and other forms of provision of further education in England and Wales which will come into force on August 1 next. No changes of special importance have been made as compared with those of last year. It is satisfactory to note that the amount of each of the royal exhibitions, &c., tenable at the Royal College of Art and the Imperial College of Science and Technology, South Kensington, has been raised from 50l. to 60l. per session. The old royal exhibitions and national scholarships tenable at the Imperial College of Science and Technology, have been combined as royal scholarships, the competition for which is to be conducted on the lines hitherto adopted for the award of national scholarships. In place of the former students-in-training in science, the Board of Education has established special studentships for teachers of science and technology who are qualified to enter on the third or fourth year of the course provided at the Imperial College. We notice that in future such teachers-in-training are not to be permitted to continue for more than two years in all at the Imperial College, a change which, in view of the need for highly qualified teachers in our provincial schools of science and technology, seems of doubtful wisdom.

THE new laboratories of St. Paul's School, built to celebrate the quatercentenary of the foundation, were opened on Wednesday, July 8, by Lord Curzon. In his address, Lord Curzon said he noticed how the school had kept pace with the spirit and reforms of the day, how during the last hundred years its numbers had increased from 153 to 500; how the modern side had grown to equal the older side in numbers and importance; and he told how great had been the achievement of the school under the late high master, Dr. Walker, one of the great school-masters of the nineteenth century. Lord Curzon went on to say that we lived in an age of self-depreciation, of a too great self-depreciation. Foreign critics were always coming to our public schools to learn how, having their superior equipment and their excellent organisation, they might obtain also "that training in character, that sense of moral responsibility, that spirit of civic patriotism, that ordered sense of personal liberty which were among the chief and most honourable characteristics of our public school system." So while content to learn from others we were not to forfeit that in our educational system which had done so much in the civic government of the country and the empire. The Bishop of Manchester referred to the conditions, so different from those obtaining now, under which he had learnt at St. Paul's School; yet he had learnt there that most valuable of lessons, to think. The high master, Dr. Hillard, said that St. Paul's had taken its full share in all those changes in educational method which began with Arnold's life at Rugby.

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, June 16.—Prof. W. J. Sollas, F.R.S., president, in the chair.—The Carboniferous Limestone of County Clare: James A. Douglas. The district forms the westernmost limit of the central Carboniferous Limestone plain of Ireland. The area, for the purposes of description, is divided into two main districts. The northern region is formed by an elevated plateau of Viséan Limestone, which rises on the north and east in terraced cliffs, but to the south-west dips below the "Coal-measure" series. The surface is of bare rock, devoid of vegetation. The southern district is not formed of limestone; the high ground on the east is of Old Red Sandstone and Silurian rocks, that on the west of Coal-measures. The older formations appear as two anticlinal flexures, forming the mountains of Slieve Aughty and Slieve Bernagh. The margin of the syncline is formed by Tournaisian shales and limestone, while the Viséan limestones occupy the core. The limestone fauna show that the Geological Survey boundary between the Upper and Lower Limestones corresponds with the transition from a Tournaisian to a Viséan fauna, and the Middle Limestone contains a fauna distinct from that of the Upper, although they are not separable on lithological grounds. The Old Red Sandstone is succeeded by a series of sandy shales containing brachiopods characteristic of the Cleistopora zone; at the base are found modioliform lamellibranchs. The Zaphrentis zone is well developed. The most remarkable portion of the whole sequence is included in the Syringothyris zone. These beds show evidence of deposition in shallow water. The fauna is compared with that of the Waulsortian phase of Belgium. The incoming of a Viséan fauna is well marked at the base of the Seminula zone; in the middle of this zone occurs an important bed of oolitic limestone, with abundant gasteropods. The Dibunophyllum zone attains a thickness equal to that of the Midland area.—The Howgill Fells and their topography: J. E. Marr, F.R.S., and W. G. Fearnside. The Howgill Fells form a monoclinical block, from which the Carboniferous rocks have been denuded. The northern slope probably corresponds with the sloping plane of unconformity between the Carboniferous rocks and Lower Palæozoic strata. On the south the slope to the Rawthey is along a block-fault. The chief drainage was originally north and south from the watershed at the summit of the block. The tract was glaciated by its own ice, but "foreign" ice was continuous with the local ice on all sides. The rocks are, from the point of view of erosive effects, nearly homogeneous. The chief erosive effects of glaciation were the

truncation of spurs, the formation of conchoidal scoops in the concavities of the valleys, a general widening of the valleys, and but slight deepening. A feature of interest is the contrast in this small area between these glaciated valleys and others of V-shaped cross-section, which are typical water-carved valleys unaffected by glacial erosion.—A new species of *Sthenurus*: L. Glaucert.—Some reptilian remains from the Trias of Lossiemouth: D. M. S. Watson. The fore-limb of *Ornithosuchus woodwardi* is shown in a specimen in the Manchester Museum. *Ornithosuchus* is restored as an animal walking on all fours, with the head carried rather low. The proportions are identical with those of *Ætosaurus*. A description is given of the skeleton of a very small reptile, interesting as recalling *Ætosaurus* in its armour.—Some reptilian tracks from the Trias of Runcorn (Cheshire): D. M. S. Watson. Four types of tracks which occur on the slab of sandstone from Weston Point, described in 1840 by Dr. Black, are discussed in this paper. It is suggested that some of these prints may quite well belong to such thecodonts as *Ornithosuchus*.—The anatomy of *Lepidophloios laricinus*, Sternb.: D. M. S. Watson.

Linnean Society, June 17.—Sir Frank Crisp, vice-president, in the chair.—The growth of a species of *Battarea*: J. G. Otto Tepper.—The deposits in the Indian Ocean: Sir John Murray.—The *Sealark* Penaeidea, Stenopidea, and Reptantia: L. A. Borradaile.—The *Sealark* Lepidoptera: T. B. Fletcher.—Report on the Porifera collected by Mr. C. Crossland in the Red Sea, part i., Calcarea: R. W. H. Row.—The African species of *Triumfetta*, Linn.: T. A. Sprague and J. Hutchinson.—New species of Malesian and Philippine ferns: Dr. H. Christ.—The acaulescent species of *Malvastrum*, A. Gray: A. W. Hill.

DUBLIN.

Royal Dublin Society, June 22.—Dr. J. M. Purser in the chair.—The fossil hare of the ossiferous fissures of Ightham, Kent, and on the recent hares of the *Lepus variabilis* group: M. A. C. Hinton. The paper describes the fossil remains of *Lepus variabilis*, Pall., obtained from the rock fissures at Ightham, and deals with the osteology of the recent and fossil hares of the *L. variabilis* group. The Pleistocene hare of England is referred to a new subspecies, *L. variabilis anglicus*, which is to be regarded as the immediate ancestor of *L. variabilis hibernicus*, its relationship with the existing Scotch form not being so close. The subspecies *anglicus* and *hibernicus* are shown to be the most primitive members of the *variabilis* group. The most important conclusion reached is that, contrary to the prevalent view, the *variabilis* group of hares has originated in temperate latitudes, and not in the high north.—The value of benzidine for the detection of minute traces of blood: Prof. E. J. McWeeney. The author began by explaining the chemical nature of benzidine, which is a di-*p*-diamino diphenyl. This substance, when dissolved in acetic acid and brought into contact with blood in presence of H_2O_2 , at once undergoes oxidation with formation of a brilliant blue colour. The reaction is in principle the same as that with guaiacol, the old-fashioned Van Deen's or Schönbein's guaiacum test. The colour base from guaiacol differs from the benzidine colour-base in the same way as an amine (aniline) differs from a phenol, or an aurine from a rosaniline dye. The test is ten-fold more delicate than that with guaiacum, and detects blood in solution as weak as 1/500,000; but for medico-legal purposes it is preferable to bring particles of the suspected matter into contact with the reagent, when each granule, if blood, at once strikes a most brilliant blue. The reaction can be observed under the microscope. The test worked well with blood-stains many years' old, and seemed to be independent of the nature of the substratum. Controls, and a time limit of about a minute, were essential, and the sensitiveness of each batch of benzidine had to be worked out beforehand. Of all the substances tested, none gave the typical blue colour so speedily as blood, save fresh vegetables and fruit, which at once struck an intense blue, at first limited to the fibro-vascular bundles. Boiling deprived them of this power, owing to the destruction of the oxydase, whereas blood solutions gave the blue reaction at once after five minutes' boiling. The author recommended this test to the attention of medical jurists.